SOLFEX
energy systems

Open terrain system Sigma I
Installation manual

810-0017

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ENGLISH

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1 Introduction

1.1 Short description

Sigma I is a mounting system for installing photovoltaic elements on open areas. It was developed for laminates and framed modules*.

The system is made of extruded aluminium and galvanised steel which means that it requires little maintenance. The use of Quickstones makes installation simple and secure.

Sigma satisfies guidelines and standards valid at the time of delivery, is up to date with current technology and complies with recognised safety-related regulations.

1.2 Intended use

voltaic laminates and modules. Any other use is deemed not to be as intended.

Intended use also includes compliance with the specifications stated in this installation manual. Mounting Systems shall not be held liable for damages arising from a failure to observe and follow the installation manual, particularly the safety instructions, or from any improper use of the product.

* When ordering framed modules, please remember to include the appropriate module (end) clamps. For enquiries and custom designs, please contact the Mounting Systems service department (telephone number PTO).

1.3 Standards and technical directives

complies with the following standards:

- DIN 18800: Design and construction of steel structures
- DIN 1055, EUROCODE 9: Action on structures
  - Part 1: Densities and weights of building materials, structural elements and stored materials
  - Part 4: Wind loads (on structures which are not susceptible to vibration)
  - Part 5: Snow loads and ice loads

1.4 About this manual

Subject of this manual

The subject of this manual is the installation of the open terrain system Sigma .

The manual describes the installation of a module. Other modules or laminates can be installed in the same way.

Specifications for the Sigma system can be found in the last chapter.

User group

Signposts

Item numbers

1 2

Step-by-step procedure

Headers

Footers

Pictograph

Denotes background and additional information for step-by-step procedures.

2 Safety

2.1 Basic safety instructions

regulations of the Employer's Liability Insurance Association.

- Comply with the relevant safety regulations.
- The presence of a second party who can provide help in the event of an accident is obligatory during the entire installation process.
- Keep a copy of this installation manual in the immediate vicinity of the system.

Warnings

DANGER

Denotes an immediately hazardous situation, failure to observe which could lead to serious injury or death.

WARNING

CAUTION

Responsibilities of the owner/operator

(see Chapter 3.1, page 4) are observed. Mounting Systems is not liable for damage occuring when these conditions are not adhered to.

- Ensure the durability of all connections and the attachment of the system.
- Ensure that suitable lifting gear is used for installation.
- Ensure that only Mounting Systems components are used when parts need to be replaced. Otherwise any warranty claim is null and void.

3 Important installation instructions

Operating conditions

Snow load: 0,8 kN/m² maximum

| Wind load: 25 m/s maximum

The prevailing statics must be checked for each site. If stresses are higher, it may be possible to adapt the system. For more detailed information, please contact the Mounting Systems service department or a local structural engineer.

The ground at the site of the proposed installation must be suitable for the use of foundation posts (Sigma posts). A project-related assessment report on the ground from an expert assessor and pull-out tests are required. The project-related ground assessment report will reveal the necessary anchoring depth and any change required in the distance between the posts.

Regarding the anchoring depth make sure that there is a distance of at least 50 cm between the cables of the laminates/modules and the ground. This avoids damages by animals.

Preparation for installation

The following tools are required to install the Sigma system:

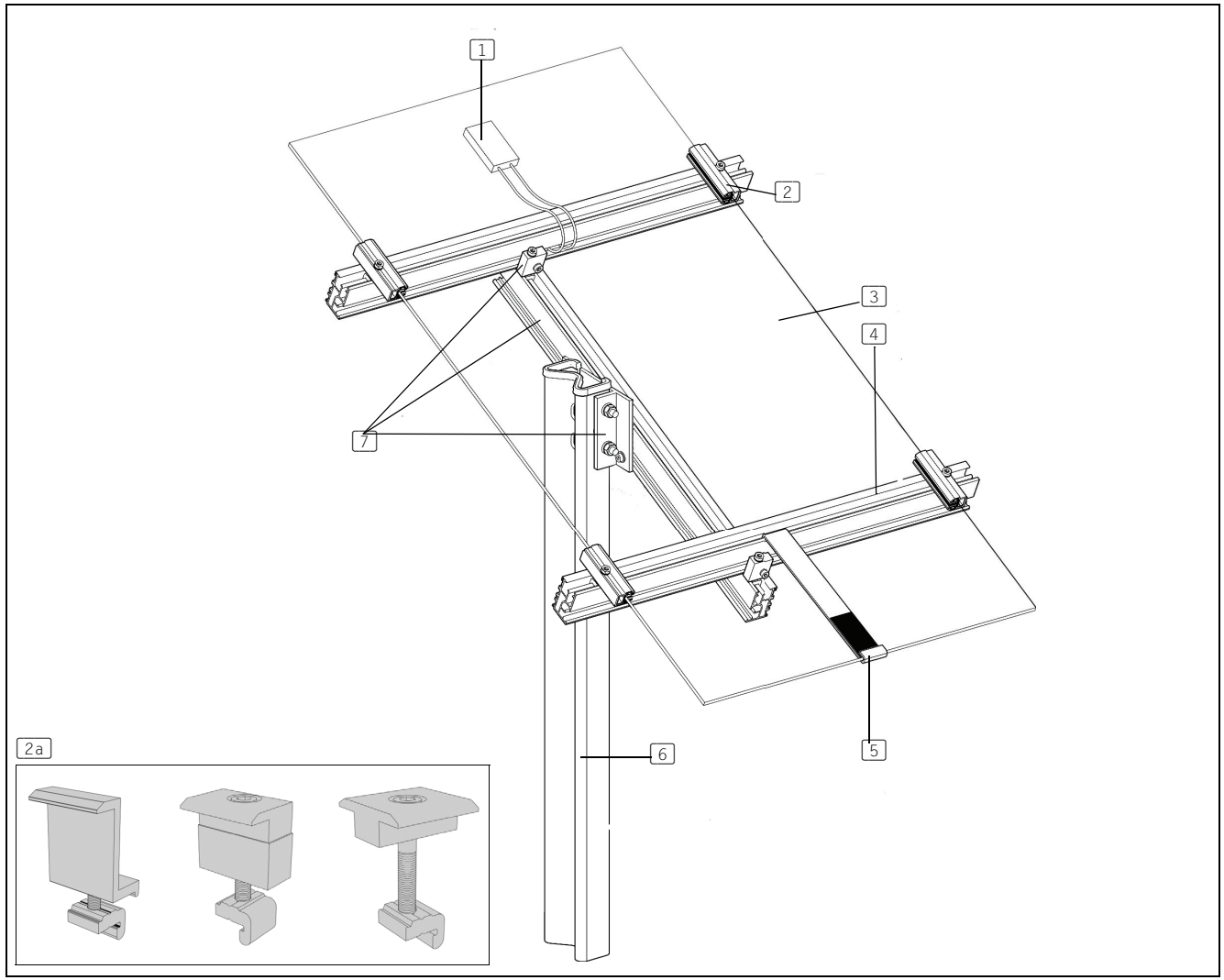
| Allen key, 6 mm

| Open-end spanner or socket, WAF 13

| Two open-ended spanners or sockets, WAF 17

4 System overview

	Connection box for cable
	Laminate (end) clamp
2a	Inter-module clamps and module end clamps for framed modules
3	Laminate
4	Base rail
5	Anti-slip protection, only for laminates
6	Foundation posts
7	Adapter, pre-assembled, comprising | Adapter plate | Cherron | 2x X-Stones

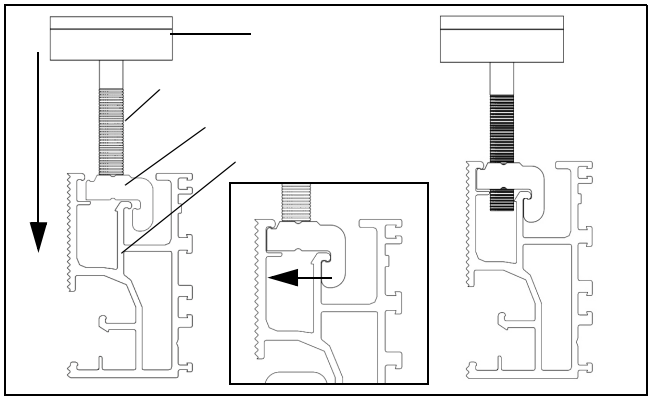


5 Installing the system

5.1 Installation procedure

5.2 Quickstone and X-Stone

X-Stones are used. These consist of an aluminium block with two pre-assembled Quickstones.



Element to be fixed (e.g. module clamp)
Allen bolt
Quickstone
Base rail

Installing the Quickstone

CAUTION

Material damage through faulty installation

Incorrectly installed Quickstone connections can rip out of the profile.

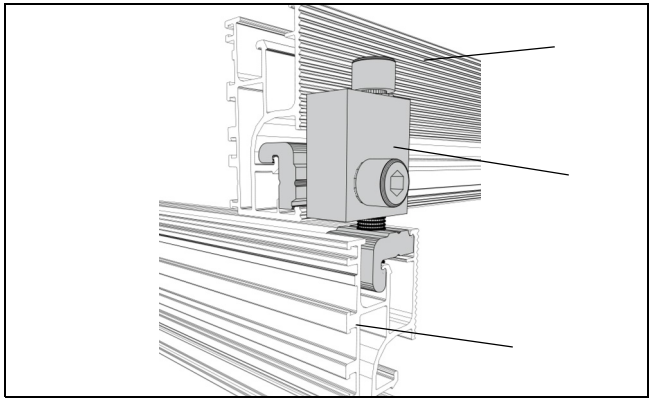
| Install all Quickstone connections as described below.

Installation

| If necessary, adjust the bolt so that it does not protrude the Quickstone.

| Fit the Quickstone from above into the profile channel so that it wedges underneath the protruding rail hooks. When fitted correctly, the Quickstone matches the form of the profile exactly.

| Tighten the bolt with a torque of 8 Nm.



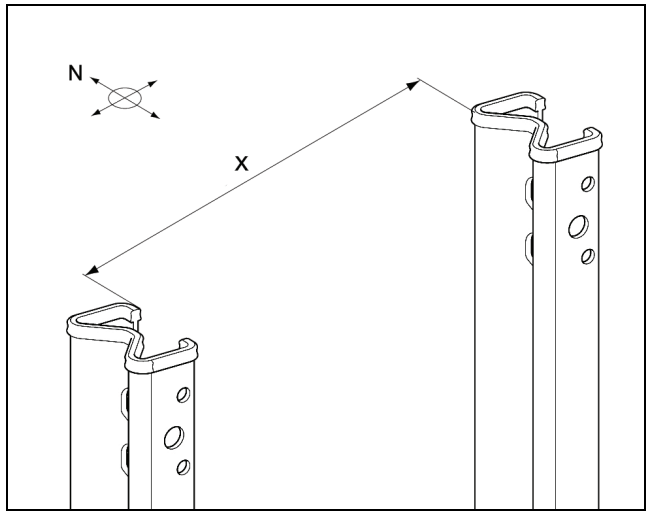
Horizontal base rail
X-Stone with 2 Quickstones
Vertical base rail

Installing the X-Stone

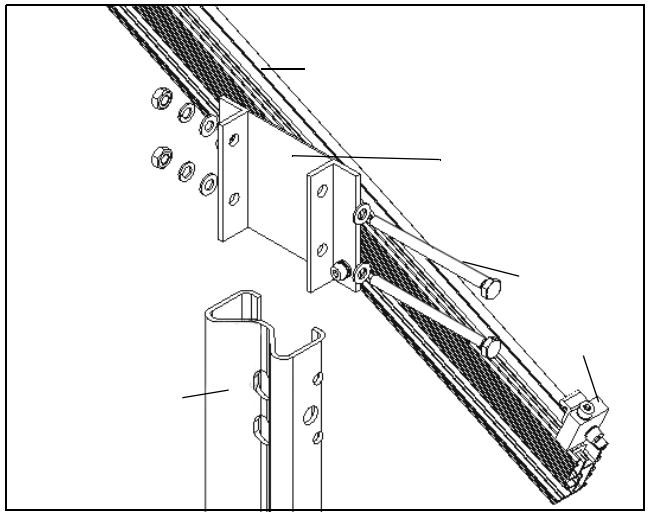
| Install both Quickstones as described above.

| Make sure that the upper rail lays flat on the lower one.

| Tighten both Quickstones completely only when you have put the rails in their final position.



Sinking posts into the ground

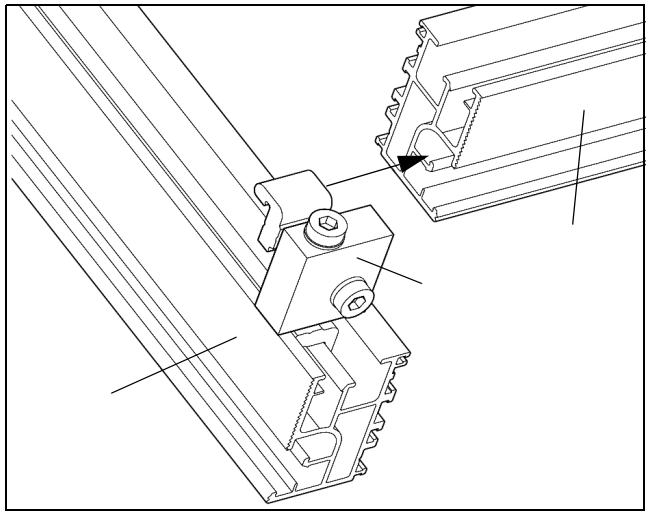


Chevron
Adapterplate
Small parts
X-Stone
Post

Fitting the adapter to the posts

The adapter is delivered pre-assembled and comprises adapterplate, chevron and 2 X-Stones.

- Hold the adapter up to the post so that the post is positioned between the two angle brackets and the open side of the Sigma profile rests against the adapter.
- Screw the adapter angle brackets to the post with the hexagon head bolts (2x M10 x 140 mm), washers (4x M10), spring washers (2x M10) and nuts (2x M10) (tightening torque 17 Nm).
- Repeat the two described steps for all other posts.



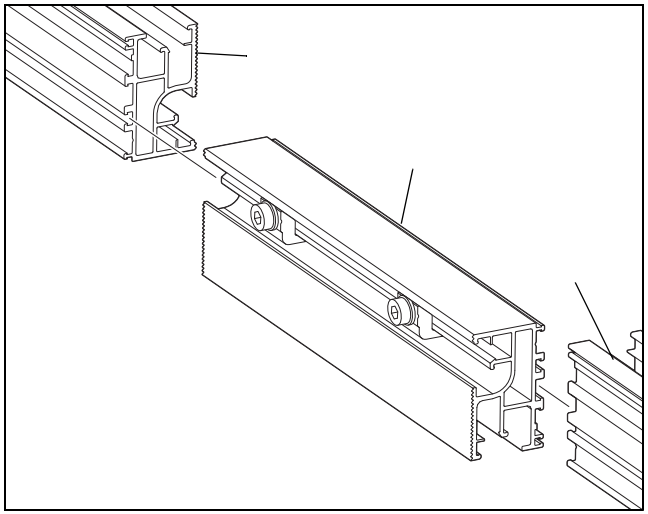
Cherron
X-Stone
Base rail

Fitting the base rails

Base rails of different lengths can be used alternately on the Sigma system.

You will find the fitting sequence in your planning documents.

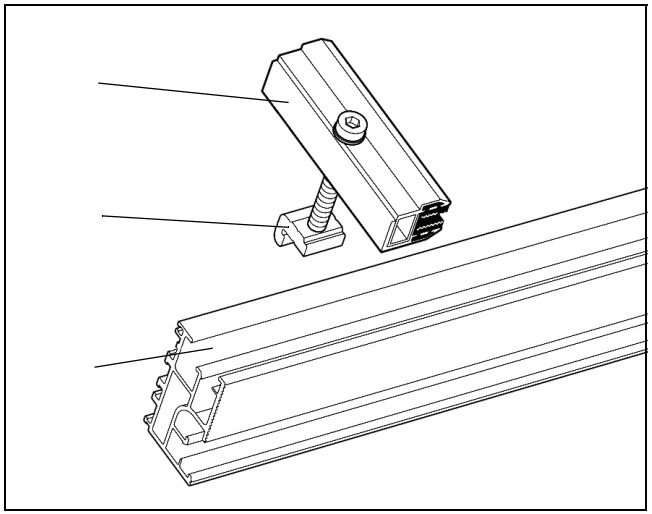
- Lay the base rails upright onto the chevrons. Please find the planned projection in your planning documents.
- Fully hook the base rail into the Quickstone on the X-Stone (see Chapter 5.1, page 6)
- Tighten the Allen bolt to fasten the base rail (Tightening torque 10 Nm).
- Repeat steps 1 to 3 for the opposite rail.

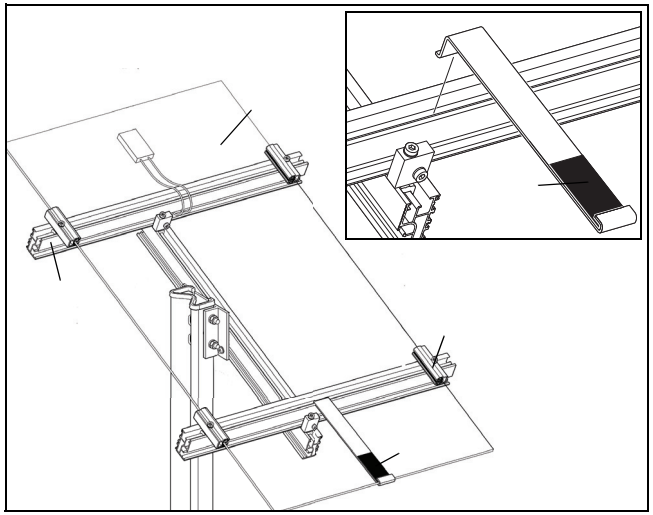


Base rail
Splice with 2 Quickstones
Base rail

Connecting the base rails

Fitting laminates





CAUTION

Laminate breakage

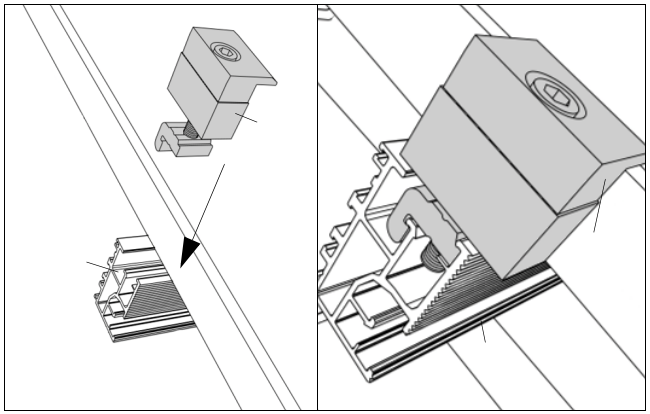
CAUTION

Material damage through faulty installation

Fitting the laminate end clamps

Fixing the laminates

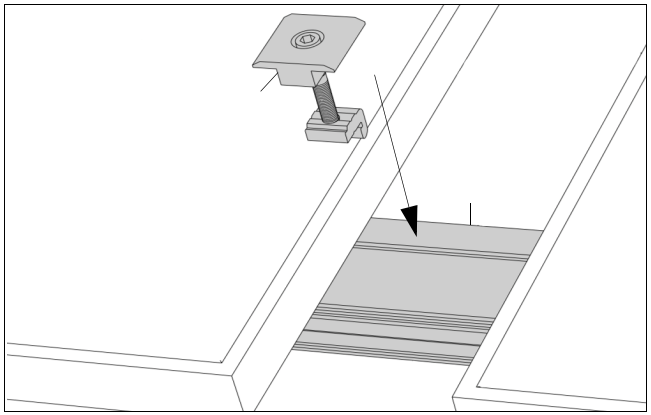
Fixing the outer modules of each row



Module end-clamp with Quickstone
Module
Base rail

Installation:

Fixing the inner modules of each row



Inter-module clamp with Quickstone
Module
Base rail

Installation:

6 Specifications

	Ground
[a]	Max. 25 m/s
Snow load[a]	Max. 0.8 kN/m^2
Laminates/modules	Unframed and framed
	In a row, up to approx. 10 m for unframed modules and 12 m for framed modules per unit
	Portrait
[b]	Standard pitch 25° and 30°
	Standard distance 70 cm, customer-specific heights possible on request
[c]	Dependent on type of laminate or module and local conditions.
[d]	
Materials	Frame section: extruded aluminium, EN AW 6063 T66, adaptor plate annodised
	Sigma - posts: galvanised steel
	Small parts: stainless steel (V2A)
	Natural extruded aluminium

a. The prevailing statics must be checked for each site. For more detailed information, please contact the Mounting Systems service department during the initial stage of our planning (contact PTO).
b. For further information, please contact the Mounting Systems service department during the initial stage of your planning (contact PTO).
c. A project-related assessment report on the ground needs to be handed in as a basis for the calculation of the specific distances. For further information, please contact the Mounting Systems service department during the initial stage of your planning (contact PTO).
d. The ramming depth will be calculated during the planning stage of the project on the basis of the ground assessment report and the project specifics. However, the thus calculated result must be double-checked on-site by way of pull-out tests.

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SOLFEX LTD
UNITS 3 - 5 CHARNLEY FOLD INDUSTRIAL ESTATE
BAMBER BRIDGE
PRESTON
LANCASHIRE
PR5 6PS
U.K.

TEL: 00 44 (0) 1772 312847
E-MAIL: sales@solfex.co.uk
WEBSITE: www.solfex.co.uk

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